GUIDELINES
FOR IMPLEMENTATION OF THE CITY OF LAKE FOREST WATER EFFICIENT LANDSCAPE REGULATIONS

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1. Purpose and Applicability

1.1 Purpose

(a) The primary purpose of these *Guidelines* is to provide procedural and design guidance for *project applicants* proposing landscape installation or landscape *rehabilitation projects* that are subject to the requirements of the *Water Efficient Landscape Regulations*. This document is also intended for use and reference by *city* staff and/or consultants in reviewing and approving designs and verifying compliance with the *Water Efficient Landscape Regulations*. The general purposes of the *Water Efficient Landscape Regulations* are to (i) promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources, by ensuring that landscape projects are not unduly water-needy and that irrigation systems are appropriately implemented to minimize water waste; and (ii) establish alternative regulations that are at least as effective as the *Model Ordinance*.

(b) Other regulations affecting landscape design, installation, and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:

(1) *city* specific plans, master plans, general plan, or similar land use and planning documents;

(2) *Grading and Excavation Code*;

(3) *Water Quality Code*;

(4) *Planning and Zoning Code*;

(5) California Government Code sections 65591 *et seq.*;

(6) National Pollutant Discharge Elimination System Permit for the *city's* Municipal Separate Storm Sewer System;

(7) Orange County Fire Authority Regulations for Fuel Modification in the Landscape;

(8) water conservation and drought response regulations of the *city* and *local water purveyor*;

(9) regulations of the *local water purveyor* governing use of *recycled water*;

(10) California Building Code as codified in Title 8, chapter 8.02 of the *Code*; and

(11) any conditions of approval for a specific project.

1.2 Applicability

(a) These *Guidelines* shall apply to all of the following *landscape projects*:

(1) *new construction* projects by public agencies or private developers of non-residential projects which have a proposed *landscaped area* equal to or greater than 2,500 square feet, and are otherwise subject to:

(A) a discretionary approval of a landscape plan, or

(B) a ministerial permit for a landscape or *water feature*;

(2) *new construction* projects by private developers, *associations*, or property managers of residential projects which have a proposed *landscaped area* equal to or greater than 2,500 square feet, and are otherwise subject to:

(A) a discretionary approval of a landscape plan, or

(B) a ministerial permit for a landscape or *water feature*;

(3) landscape *rehabilitation projects* by public agencies, private developers, associations, or property managers of residential or non-residential projects which:

(A) have a proposed *landscaped area* equal to or greater than 2,500 square feet,

(B) propose to rehabilitate fifty percent (50%) or more of the existing *landscaped area*, and

(C) are otherwise subject to:

(i) a discretionary approval of a landscape plan, or

(ii) a ministerial permit for a landscape or *water feature*;

(4) homeowner installed landscape for *new construction* of single-family or multiple-family residential property, which have a proposed *landscaped area* equal to or greater than 5,000 square feet, and are otherwise subject to:

(A) a discretionary approval of a landscape plan, or

(B) a ministerial permit for a landscape or *water feature*;

(5) *homeowner installed* landscape *rehabilitation projects* for single-family or multiple-family residential property, which:

(A) have a proposed *landscaped area* equal to or greater than 5,000 square feet,

(B) propose to rehabilitate fifty percent (50%) or more of the existing *landscaped area*, and

(C) are otherwise subject to:

(i). a discretionary approval of a landscape plan, or

(ii) a ministerial permit for a landscape or *water feature*.

(b) These *Guidelines* do not apply to:

(1) registered local, *State*, or federal historical sites;

(2) *ecological restoration projects* that do not require a permanent irrigation system;

(3) *mined-land reclamation projects* that do not require a permanent irrigation system;

(4) plant collections, as part of botanical gardens and arboretums open to the public;

(5) cemeteries; and

(6) any other new landscape installation project and landscape rehabilitation project not listed in Code section 9.146.110.3(A) and Section 1.2(a) hereof.

(c) Notwithstanding the provisions of Section 1.2(b) hereof, Sections 2.8 and 2.9 of these *Guidelines* shall apply to cemeteries.

2. Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects

2.1 Elements of the Landscape Documentation Package and Landscape Submittal Sheet

A *Landscape Documentation Package* and *Landscape Submittal Sheet* are required to be submitted by the *project applicant* for review and approval prior to the issuance of ministerial permits by the *city* for *landscape projects* or *water features*, and prior to start of construction. Unless otherwise directed by the *city*, the *Landscape*

Documentation Package shall include the following elements, either on plan sheets or supplemental pages as directed by the *city*:

(a) project information, including, but not limited to, the following: date; project name (if applicable); project address, parcel, tract, and/or lot number(s);

(b) total *landscaped area* (square feet) and *landscaped area* of the *rehabilitation project* (if applicable); project type (e.g., *new construction*, *rehabilitation project*, public, private, cemetery, *homeowner installed*, commercial, industrial, business, single-family, multi-family); water supply type (e.g., potable, recycled, or well) and identify the *local water purveyor* if the *project applicant* is not served by a private well;

(c) the *Checklist of Landscape Documentation Package* in accordance with **Appendix G** hereof;

(d) project contacts, including contact information for the *project applicant* and *owner*;

(e) a *Certification of Landscape Design* in accordance with **Appendix E** hereof that includes a *landscape professional's* professional stamp, as applicable, signature, contact information (including email and telephone number), license number, and date, certifying the statement that, "The design of this project complies with the requirements of the *city's Water Efficient Landscape Regulations*" and shall bear the signature of such *landscape professional* as required by law;

(f) a *Landscape Submittal Sheet* in accordance with **Appendix D** of these *Guidelines*;

(g) *Maximum Applied Water Allowance* (*MAWA*) and *Estimated Applied Water Use* (*EAWU*) calculations, expressed as annual totals, including, but not limited to, the following: a *Water Efficient Landscape Worksheet* (optional at discretion of the *city*) for the *landscape project*; *hydrozone* information table (optional at the discretion of the *city*) for the *landscape project*; and water budget calculations (optional at the discretion of the *city*) for the *landscape project*;

(h) a soil management report or specifications, or specification provision requiring soil testing and amendment recommendations and implementation to be accomplished during construction of the *landscape project*;

(i) a landscape design plan for the *landscape project*, including identification of the plant material to be installed;

(j) an irrigation design plan for the *landscape project*;

(k) a grading design plan, unless grading information is included in the landscape design plan for the *landscape project*, or unless the *landscape project* is limited to replacement planting and/or irrigation to rehabilitate an existing *landscaped*

area. The grading design plan shall conform to the provisions of the *Grading and Excavation Code* and any applicable provisions of the *Water Quality Code* and *Planning and Zoning Code*; and

(l) any other information the *city* or the *project applicant* deems relevant for determining whether the *landscape project* complies with the *Water Efficient Landscape Regulations* and these *Guidelines*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.2 Water Efficient Landscape Calculations and Alternatives

(a) The *project applicant* shall provide the calculated *Maximum Applied Water Allowance (MAWA)* and *Estimated Applied Water Use (EAWU)* for the *landscaped area* as part of the *Landscape Documentation Package* submitted to the *city*.

(b) The *project applicant* shall complete the *Water Efficient Landscape Worksheets* in accordance with the sample worksheets in **Appendix C** hereof and shall comply with the following provisions:

(1) The *EAWU* allowable for the *landscaped area* shall not exceed the *MAWA*. The *MAWA* shall be calculated using an *Evapotranspiration Adjustment Factor* (*ETAF*) of 0.7, except for the portion of the *MAWA* applicable to any *special landscaped areas* within the *landscape project*, which shall be calculated using an *ETAF* of 1.0. Where the design of the *landscaped area* can otherwise be shown to be equivalently water-efficient, the *project applicant* may submit alternative or abbreviated information supporting the demonstration that the annual *EAWU* is less than the *MAWA*, at the discretion of and for the review and approval of the *city*.

(2) Water budget calculations shall adhere to the following requirements:

(A) The *MAWA* shall be calculated using the *Water Efficient Landscape Worksheets* and equation presented in **Appendix C** on page C-4. The example calculation on page B-1 thereof is a hypothetical example to demonstrate proper use of the equation.

(B) The *Estimated Applied Water Use* shall be calculated using the *Water Efficient Landscape Worksheets* and equation presented in **Appendix C** on page C-5. The example calculation on page C-2 thereof is a hypothetical example.

(C) For the calculation of the *MAWA* and *EAWU*, a *project applicant* shall use the *ETo* values from the Reference Evapotranspiration (ETo) Table in **Appendix B**.

(D) For calculation of the *EAWU*, the *plant water use factor* shall be determined as appropriate to the project location from the *Water Use Classification of Landscape Species* (*WUCOLS*) species evaluation list. The *plant factor* is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.

(E) For calculating the *EAWU*, the *plant water use factor* shall be determined for each *valve hydrozone* based on the highest-water-use plant species within the *hydrozone*. At the option of the *project applicant* or the *city*, the *plant factor* for each *hydrozone* may be required to be further refined as a "landscape coefficient" according to protocols defined in detail in the *WUCOLS* document, to reflect planting density and microclimate effects on water needs.

(F) For calculation of the *EAWU*, the area of a *water feature* shall be defined as a high water use *hydrozone* with a *plant factor* of 1.0.

(G) For calculation of the *EAWU*, a temporarily irrigated *hydrozone* area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use *hydrozone* with a *plant factor* of 0.1.

(H) For calculation of the *MAWA*, the *ETAF* for s*pecial landscaped areas* shall be set at 1.0. For calculation of the *EAWU*, the *ETAF* for s*pecial landscaped areas* shall be calculated as the *special landscaped area* (*SLA*) *plant factor* divided by the *SLA irrigation efficiency factor*.

(I) *Irrigation efficiency* shall be calculated using the worksheet and equation presented in **Appendix C** on page C-5**.**

(3) The *MAWA* shall adhere to the following requirements:

(A) The *MAWA* shall be calculated using the equation presented in **Appendix C** on page C-4. The example calculation in **Appendix C** on page C-1 is a hypothetical to demonstrate proper use of the equation and does not represent an existing and/or planned *landscape project*. The *reference evapotranspiration* (*ETo*) values used in this calculation are from the Reference Evapotranspiration (ETo) Table in **Appendix B**, and are for planning purposes only.

(B) For actual irrigation scheduling, automatic irrigation controllers are required and shall use current *ETo* data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

2.3 Soil Management Report

(a) In order to reduce *runoff* and encourage healthy plant growth, a soil management report shall be completed by the *project applicant*, or his/her designee, as follows:

(1) Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations.

(2) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

(b) The soil analysis may include, but is not limited to:

(1) soil texture;

(2) infiltration rate determined by laboratory test or soil texture infiltration rate table;

(3) pH;

(4) total soluble salts;

(5) sodium;

(6) percent organic matter; and

(7) recommendations.

(c) The *project applicant*, or his/her designee, shall comply with one of the following:

(1) if significant mass grading is not planned, the soil analysis report shall be submitted to the *city* as part of the *Landscape Documentation Package*; or

(2) if significant mass grading is planned, the soil analysis report shall be submitted to the *city* as part of the *Certificate of Completion.*

(d) The soil analysis report shall be made available, in a timely manner, to the *landscape professional* preparing the landscape design plans and irrigation design plans to make any necessary adjustments to such design plans.

(e) The *project applicant*, or his/her designee, shall submit documentation verifying implementation of the soil analysis report recommendations to the *city* with the *Certificate of Completion*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.4 Landscape Design Plan

For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the *Landscape Documentation Package*:

(a) Plant material may be selected for the *landscaped area*, provided the *EAWU* in the *landscaped area* does not exceed the *MAWA*. To encourage the efficient use of water, the following is highly recommended:

(1) protect and preserve non-invasive *water-conserving plant species* and *water-conserving turf*;

(2) select *water-conserving plant species* and water-conserving *turf*;

(3) select plants based on disease and pest resistance; and

(4) select trees based on applicable *city* tree requirements and tree shading guidelines.

(b) Each *hydrozone* shall have plant materials with similar water use, with the exception of *hydrozones* with plants of mixed water use, as specified in Section 2.5(f) of these *Guidelines*.

(c) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended for the landscape design plan: use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate; recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); and consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

(d) *Turf* is discouraged on slopes greater than 25% where the toe of the slope is adjacent to an *impervious hardscape* and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

(e) A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the Orange County Fire Authority, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements shall have priority.

(f) The use of *invasive plant species* and/or *noxious plant species* is strongly discouraged.

(g) The architectural guidelines of a *common interest development* shall not prohibit or otherwise include conditions that have the effect of prohibiting the use of *water efficient plant species* as a group.

(h) *Water features* shall comply with the following:

(1) Recirculating water systems shall be used for any *water feature*.

(2) Where available and consistent with public health guidelines, *recycled water* shall be used as a source for decorative *water features*.

(3) The surface area of a *water feature* shall be included in the high water use *hydrozone* area of the water budget calculation.

(4) Approved safety pool covers are highly recommended for pools, hot tubs, spas, portable spas, and nonportable wading pools.

(i) *Mulch* and other soil amendments shall be required in the following circumstances and be applied in compliance with following:

(1) A minimum two inch (2″) layer of *mulch* shall be applied on all exposed soil surfaces of planting areas; it shall not be applied in *turf* areas, creeping or rooting groundcovers, or direct seeding applications where *mulch* is contraindicated.

(2) Stabilizing mulching products shall be used on slopes.

(3) The mulching portion of the seed/*mulch* slurry in hydro-seeded applications shall meet the mulching requirement.

(4) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 2.3 of these *Guidelines*).

(j) The landscape design plan, at a minimum, shall:

(1) delineate and label each *hydrozone* by number, letter, or other method;

(2) identify each *hydrozone* as low, moderate, high water or mixed water use. Temporarily irrigated areas of the *landscaped area* shall be included in the low water use *hydrozone* for the water budget calculation;

(3) identify recreational areas; identify areas permanently and solely dedicated to edible plants;

(4) identify areas irrigated with *recycled water*; identify type of *mulch* and application depth;

(5) identify soil amendments, type, and quantity; identify type and surface area of *water features*;

(6) identify *hardscapes* (*pervious* and *impervious*);

(7) identify location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Storm water best management practices are encouraged in the landscape design plan. Examples include, but are not limited to:

(A) infiltration beds, swales, and basins that allow water to collect and soak into the ground;

(B) constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants; and

(C) *pervious* or porous surfaces (e.g., permeable pavers or blocks, *pervious* or porous concrete, etc.) that minimize *runoff*;

(8) identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);

(9) contain the following statement: "I have complied with the criteria of the *Water Efficient Landscape Regulations* and applied them for the efficient use of water in the landscape design plan;" and

(10) bear the signature of a California licensed *landscape professional*.

[Note: Authority Cited: Section 65595, Reference: Section 65596, Government Code and Section 1351, Civil Code.]

2.5 Irrigation Design Plan

For the efficient use of water, an irrigation system shall meet all of the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the *Landscape Documentation Package*:

(a) Dedicated landscape water meters are highly recommended on *landscaped areas* smaller than 5,000 square feet to facilitate water management.

(b) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.

(c) The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

(d) If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

(e) *Static water pressure*, dynamic or *operating pressure* and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

(f) *Sensors* (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

(g) Manual shut-off *valves* (such as a gate *valve*, ball *valve*, or butterfly *valve*) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a *main line* break) or routine repair.

(h) *Backflow prevention devices* shall be required to protect the water supply from contamination by the irrigation system. A *project applicant* shall refer to the applicable *city Code* provisions (i.e., public health) for additional backflow prevention requirements.

(i) High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.

(j) The irrigation system shall be designed to prevent *runoff*, low head drainage, *overspray*, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, *hardscapes*, roadways or structures.

(k) Relevant information from the soil management plan, such as soil type and *infiltration rate*, shall be utilized when designing irrigation systems.

(l) The design of the irrigation system shall conform to the *hydrozones* of the landscape design plan.

(m) Average *irrigation efficiency* for the project shall be determined in accordance with the *EAWU* calculation sheet in **Appendix C** on page C-5. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the *project applicant***,** the *irrigation efficiency* of the *sprinkler heads* used within each *hydrozone* shall be assumed to be: pop-up stream rotator heads = 75%; stream rotor heads = 75%; microspray = 75%; bubbler = 80%; drip emitter = 85%; and subsurface irrigation = 90% .

(n) In mulched planting areas, the use of *low volume irrigation* is required to maximize water infiltration into the root zone.

(o) *Sprinkler heads* and other emission devices shall have matched *precipitation rates*, unless otherwise directed by the manufacturer's recommendations.

(p) *Swing joints* or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

(q) *Check valves* or *anti-drain valves* shall be installed for all irrigation systems.

(r) Narrow, or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or *low volume overhead irrigation* system.

(s) Overhead irrigation shall not be permitted within 24 inches of any *impervious* surface. Allowable irrigation within the setback from *impervious* surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be *mulch*, gravel, or other porous material. These restrictions may be modified if:

(1) the *landscaped area* is adjacent to permeable surfacing and no *runoff* occurs; or

(2) the adjacent *impervious* surfaces are designed and constructed to drain entirely to landscaping; or

(3) the irrigation designer for the *landscape project* specifies an alternative design or technology, as part of the *Landscape Documentation Package* and clearly demonstrates strict adherence to irrigation system design criteria in Section 2.5 (b)(3) hereof. Prevention of *overspray* and runoff must be confirmed during an *irrigation audit* performed by the *city*.

(t) Slopes greater than 25% shall not be irrigated with an irrigation system with a *precipitation rate* exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer of the *landscape project* specifies an alternative design or technology, as part of the *Landscape Documentation Package*, and clearly demonstrates no *runoff* or erosion will occur. Prevention of *runoff* and erosion must be confirmed during the *irrigation audit*.

(u) All new irrigation controllers installed within the *city* after January 1, 2012, shall be *smart automatic irrigation controllers.*

(v) In preparing an irrigation design plan, it is highly recommended that:

(1) the *project applicant* inquire with the *local water purveyor*

about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system;

(2) the design plan includes *sprinkler head* to *sprinkler head* coverage. However, sprinkler spacing shall be designed to achieve the highest possible *distribution uniformity* using the manufacturer's recommendations.

(w) For each *hydrozone*, the irrigation design plan shall comply with the following requirements:

(1) Each *valve* shall irrigate a *hydrozone* with similar site, slope, sun exposure, soil conditions and plant materials with similar water use.

(2) *Sprinkler heads* and other emission devices shall be selected based on what is appropriate for the plant type within that *hydrozone*.

(x) Where feasible, trees shall be placed on separate *valves* from shrubs, groundcovers, and *turf*.

(y) Individual *hydrozones* that mix plants of moderate and low water use or moderate and high water use, may be allowed if:

(1) the *plant factor* calculation is based on the proportions of the respective plant water uses and their respective *plant factors*; or

(2) the *plant factor* of the higher water using plant is used for the calculations.

(z) Individual *hydrozones* that mix high and low water use plants shall not be permitted.

(aa) On the landscape design plan and irrigation design plan, *hydrozone* areas shall be designated by number, letter or other designation. On the irrigation design plan, the areas irrigated by each *valve* shall be designated and assign a number to each *valve*.

(bb) The irrigation design plan, at a minimum, shall contain:

(1) the location and size of separate water meters for landscape;

(2) the location, type and size of all components of the irrigation system, including controllers, main and *lateral lines*, *valves*, *sprinkler heads*, moisture sensing devices, rain switches, quick couplers, pressure regulators, and *backflow prevention devices*;

(3) *static water pressure* at the point of connection to the public water supply;

(4) *flow rate* (gallons per minute), application rate (inches per hour) and design *operating pressure* (pressure per square inch) for each *station*;

(5) irrigation schedule parameters necessary to program *smart automatic irrigation controllers* specified in the landscape design;

(6) the following statement: "I have complied with the criteria of the *Water Efficient Landscape Regulations* and applied them accordingly for the efficient use of water in the irrigation design plan;" and

(7) the signature of a licensed *landscape professional.*

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.6 Grading Design Plan

(a) For the efficient use of water, grading of a *landscape project* site shall be designed to minimize soil erosion, *runoff* and water waste. The finished grading configuration of the *landscaped area*, including pads, slopes, drainage, post-construction erosion control and storm water control Best Management Practices as applicable, shall be shown on the landscape plan unless this information is fully included in separate grading plans for the project; or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing *landscaped area*. In addition to the provisions contained herein, the grading design plan shall comply with the provisions of the *Grading and Excavation Code* and any applicable provisions of the *Water Quality Code* and *Planning and Zoning Code*.

(b) The *project applicant* shall submit a landscape grading plan that indicates finished configurations and elevations of the *landscaped area* including, but limited to: height of graded slopes; drainage patterns; pad elevations; finish grade; and storm water retention improvements, if applicable.

(c) To prevent excessive erosion and *runoff*, it is highly recommended that the *project applicant*: grade so that all irrigation and normal rainfall remains within property lines and does not drain on to *impervious hardscapes*; avoid disruption of natural drainage patterns and undisturbed soil; and avoid soil compaction in *landscaped areas*.

(d) The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of the *landscape professional* for the *landscape project*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.7 Certificate of Completion

(a) Landscape project installation shall not proceed until (i) the *project applicant* has deposited with the *city* all applicable permit fees in accordance with the *city's* applicable fee schedule; (ii) the *Landscape Documentation Package* has been approved by the *city*; and (iii) any ministerial permits required are issued.

(b) The *project applicant* shall notify the *city* at the beginning of the installation work and at intervals as necessary for the duration of the *landscape project* work, to schedule all required inspections.

(c) A *Certificate of Completion* for the *landscape project* shall be obtained through a Certificate of Use and Occupancy or a *Permit* Final issued by the *city*. The requirements for the final inspection and *permit* closure shall include the following:

(1) The *project applicant* shall submit to the *city* a *Certificate of Completion* in the form included as **Appendix F** of these *Guidelines*, which shall include: (i) certification by a *landscape professional* that the *landscape project* has been installed per the approved *Landscape Documentation Package*; and (ii) the following statement: "The landscaping has been installed in substantial conformance to the design plans, and complies with the provisions of the *Water Efficient Landscape Regulations* for the efficient use of water in the landscape."

(2) The *project applicant* shall provide documentation of the irrigation scheduling parameters used to set the irrigation controller(s).

(3) At the option of the *city*, the *project applicant* may be required to submit one or more of the following: (i) an *irrigation audit* report from a *Certified Landscape Irrigation Auditor*; (ii) documentation of enrollment in a *city*, state, regional or *local water purveyor* sponsored water conservation and/or drought response and/or water conservation program; and/or (iii) documentation that the *MAWA* and *EAWU* information for the *landscape project* has been submitted to the *local water purveyor*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.8 Post-Installation Irrigation Scheduling

(a) For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

(1) Irrigation schedules shall be regulated by automatic irrigation controllers.

(2) Irrigation schedules and overhead irrigation shall be scheduled and/or adjusted in compliance with any applicable *city*, *State*, regional, or local water conservation and/or drought response laws, rules, policies, and regulations. Operation of the irrigation system outside the normal *watering window* is allowed for auditing and system maintenance.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

2.9 Post-Installation Landscape and Irrigation Maintenance

Landscapes shall be maintained to ensure water use efficiency in accordance with the *Code* and any applicable *city*, *State*, regional, or *local water purveyor* water conservation and/or drought response laws, rules, policies, or regulations.

3. Provisions for Existing Landscapes

(a) Irrigation of all *landscaped areas* shall be conducted in a manner conforming to the rules, regulations, and requirements, and shall be subject to the penalties and incentives for water conservation and water waste prevention, as determined and implemented by the *local water purveyor* and/or the c*ity*.

(b) The *city* may administer programs such as irrigation water use analyses, irrigation surveys, and/or *irrigation audits*, tiered water rate structures, water budgeting by parcel or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a *MAWA* calculated with an *ETAF* of 0.8 to all *landscaped areas* in the *city* over one acre in size. The *city* may, pursuant to a contract or other agreement, elect to have a *local water purveyor,* contractor, or other local agency administer such programs.

(c) The architectural guidelines of a *common interest development* shall not prohibit or otherwise include conditions that have the effect of prohibiting the use of low-water use plants or *water-conserving plant species* as a group.

4. Conflicting Provisions.

The provisions of these *Guidelines* are in addition to any other requirements, laws, rules, policies, or regulations imposed or adopted by the *city.* If the provisions of these *Guidelines* are in conflict with each other, other provisions of the *Code*, the *city's* general plan, any *city* adopted specific plan or master plan, any resolution or ordinance of the *city*, or any *State* law or regulation, any applicable *city*, *State*, regional, or *local water purveyor* water conservation or drought response requirements, laws, rules, policies, or regulations, or requirements of the Orange County Fire Authority pertaining to fire-prone areas and fuel modification zones, the more restrictive provisions shall apply.

APPENDIX A – DEFINITIONS

DEFINITIONS

Unless the context otherwise requires, the italicized terms used in these *Guidelines* shall have the meanings set forth below:

"*Association*" means a nonprofit corporation or unincorporated association created for the purpose of managing a *common interest development*.

"*Backflow prevention device*" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

"*Certificate of Completion*" means the certificate included in **Appendix F** hereof and required to be completed and submitted to the *city* pursuant to Section 2.7(a)(1) of hereof, and certifying that the *landscape project* has been installed in substantial conformance with the approved *Landscape Documentation Package* and complies with the provisions of the *Water Efficient Landscape Regulations* and these *Guidelines*.

"*Certification of Landscape Design*" means the certification included as **Appendix E** of these *Guidelines* that must be included in the *Landscape Documentation Package* pursuant to Section 2.1 of these Guidelines.

"*Certified Landscape Irrigation Auditor*" means a *person* designated by the *city* to conduct an *irrigation audit*.

"*Check valve*" or "*anti-drain valve*" means a valve located under a *sprinkler head*, or other location in the irrigation system, to hold water in the system to prevent drainage from *sprinkler heads* when the sprinkler is off.

"*Checklist of Landscape Documentation Package*" means the checklist or index of all documents in the *Landscape Documentation Package* similar in form to the checklist included in **Appendix G** hereof.

"*City*" means the City of Lake Forest, or its authorized designee.

"*Code*" means the City of Lake Forest Municipal Code.

"*Common interest development*" means a community apartment project, condominium project, planned development, and stock cooperative per Civil Code Section 1351.

"*Conversion factor*" means the number that converts acre-inches per acre per year to gallons per square foot per year.

"*Distribution uniformity*" or "*DU*" is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges form zero to 100 percent.

"*Drip irrigation*" means any non-spray *low volume irrigation* system utilizing emission devices with a *flow rate* measured in gallons per hour. *Low volume irrigation* systems

are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

"*Ecological restoration project*" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

"*Emitter*" means a *drip irrigation* emission device that delivers water slowly from the system to the soil.

"*Estimated Applied Water Use*" or "*EAWU*" means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as *reference evapotranspiration*, the size of the *landscaped area*, *plant water use factors*, and the *irrigation efficiency* within each *hydrozone*.

"*Evapotranspiration Adjustment Factor*" or "*ETAF*" means the factor that is equal to the *plant factor* divided by the *irrigation efficiency* factor for a *landscape project*, as described in these *Guidelines*. The *ETAF* is calculated in the context of local *reference evapotranspiration*, using site-specific *plant factors* and *irrigation efficiency* factors that influence the amount of water that needs to be applied to the specific *landscaped area*. A combined plant mix with a site-wide average *plant factor* of 0.5 (indicating a moderate water need) and average *irrigation efficiency* of 0.71 produces an *ET adjustment factor* of (0.7) = (0.5/0.71), which is the standard of water use efficiency generally required by the *Water Efficient Landscape Regulations* and the *Guidelines,* except that the *ETAF* for a *special landscaped area* shall not exceed 1.0.

"*Evapotranspiration rate*" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

"*Flow rate*" means the rate at which water flows through pipes, *valves* and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

"*Grading and Excavation Code*" means Title 8, Chapter 8.30 of the *Code*.

"*Hardscapes*" means any durable material or feature (*pervious* and *impervious*) installed in or around a *landscaped area*, such as pavements or walls. Pools and other water features are considered part of the *landscaped area* and not considered *hardscapes* for purposes of these Guidelines.

"*Homeowner installed*" means any landscaping either installed by a private individual for a single family residence or installed by a landscape professional hired by a homeowner. A homeowner, for purposes of this ordinance, is a *person* who occupies the dwelling he or she owns or rents. This definition excludes speculative homes, which are not *owner*-occupied dwellings and which are subject under Section 9.146.110.3(A)(2) to the requirements applicable to developer-installed single-family and multi-family residential landscape projects.

"*Hydrozone*" means a portion of the *landscaped area* having plants with similar water needs and typically irrigated by one *valve*/controller station. A *hydrozone* may be irrigated or non-irrigated.

"*Impervious*" means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

"*Infiltration rate*" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

"*Invasive plant species*" or "*noxious plant species*" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. *Invasive plant species* may be regulated by county agricultural agencies as *noxious species*. Lists of invasive plants are maintained at the California Invasive Plant Inventory and United States Department of Agriculture invasive and noxious weed database.

"*Irrigation audit*" means an in-depth evaluation of the performance of an irrigation system conducted by a *Certified Landscape Irrigation Auditor*. An *irrigation audit* includes, but is not limited to: inspection, system tune-up, system test with *distribution uniformity* or emission uniformity, reporting *overspray* or *runoff* that causes overland flow, and preparation of an irrigation schedule.

"*Irrigation efficiency*" or "*IE*" means the measurement of the amount of water beneficially used divided by the amount of water applied to a *landscaped area*. *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average *irrigation efficiency* for purposes of these *Guidelines* is 0.71. Greater *irrigation efficiency* can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

(a) Pop-up stream rotator heads = 75%

(b) Stream rotor heads = 75%

(c) Microspray = 75%

(d) Bubbler = 80%

(e) Drip emitter = 85%

(f) Subsurface irrigation = 90%

"*Irrigation Management Efficiency"* or "*IME*" means the measurement used to calculate the *irrigation efficiency* of the irrigation system for a *landscape project*. A 90% *IME* can be achieved by using evaportranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

"*Landscape coefficient*" (K_L) is the product of a *plant factor* multiplied by a density factor and a *microclimate* factor. The *landscape coefficient* is derived to estimate water loss from irrigated *landscaped areas* and *special landscaped areas*.

"*Landscape Documentation Package*" means the package of documents that a *project applicant* is required to submit to the *city* pursuant to Section 2.1 of these *Guideline*s.

"*Landscape professional*" means a licensed landscape architect, licensed landscape contractor, or any other *person* authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

"*Landscape project*" means the total area of landscape in a project as provided in the definition of "*landscaped area*" meeting the requirements under section 9.146.110.3(A) of the *Code* .

"*Landscape Submittal Sheet*" means the form that a *project applicant* is required to submit to the *city* pursuant to Section 2.1 of these *Guideline*s and included as **Appendix D** of these *Guidelines*.

"*Landscaped area*" means all the planting areas, *turf* areas, and *water features* in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The *landscaped area* does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other *pervious* or *impervious hardscapes*, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"*Lateral line*" means the water delivery pipeline that supplies water to the *emitters* or sprinklers from the *valve*.

"*Local water purveyor*" means any entity, including a public agency, city, county, or private water company that provides retail water service within the *city*.

"*Low volume irrigation*" means the application of irrigation water at low pressure through a system of tubing or *lateral lines* and low-volume *emitters* such as drip, drip lines and bubblers. *Low volume irrigation* systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

"*Low volume overhead irrigation*" means aboveground irrigation heads with an upper flow limit of 0.5 gallons per minute.

"*Main line*" means the pressurized pipeline that delivers water from the water source to the *valve* or outlet.

"*Maximum Applied Water Allowance*" or "*MAWA*" means, the upper limit of annual applied water for the established *landscaped area* as specified in Section 2.2 of these *Guidelines*. It is based upon the area's *reference evapotranspiration*, the *ETAF*, and the

size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.

"*Microclimate*" means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density or proximity to reflective surfaces.

"*Mined-land reclamation projects*" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

"*Model Ordinance*" means the Model Water Efficient Landscape Ordinance which was adopted by the California Department of Water Resources in accordance with California Government Code section 65591 *et seq*.

"*Mulch*" means any organic material such as leaves, bark, straw, compost or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature and preventing soil erosion.

"*New construction*" means a new building with landscaping or a landscape-dominated project, such as a park, playground, playing field, or greenbelt or other new landscape, which may or may not have an associated building or structure.

"*Operating pressure*" means the pressure at which the parts of an irrigation system of sprinklers are designed by the manufacturer

"*Overspray*" means the irrigation water which is delivered beyond the target irrigation area.

"*Owner*" means the record owner of real property as shown on the most recently issued equalized assessment roll.

"*Person*" means any natural person, firm, joint venture, joint stock company, partnership, public or private *association*, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the *city* or the *local water purveyor*, or the manager, lessee, agent, servant, officer or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

"*Pervious*" means any surface or material that allows the passage of water through the material and into the underlying soil.

"*Planning and Zoning Code*" means Title 9 of the *Code*.

"*Plant factor*" or "*plant water use factor*" is a factor, when multiplied by *ETo*, estimates the amount of water needed by plants. For purposes of this *Water Efficient Landscape Regulations*, the *plant factor* range for low water use plants is 0 to 0.3, the *plant factor*

range for moderate water use plants is 0.4 to 0.6, and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in these *Guidelines* are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species."

"*Precipitation rate*" means the rate of application of water measured in inches per hour.

"*Project applicant*" means the *person* submitting a *Landscape Documentation Package* pursuant to Section 2.1 of these *Guidelines*, to request a permit, plan check or design review from the *city* for the installation of landscape.

"*Reference evapotranspiration*" or "*ETo*" means a standard measurement of environmental parameters which affect the water use of plants. *ETo* is given expressed in inches per day, month, or year as represented in **Appendix B** of these *Guidelines*, and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. *Reference evapotranspiration* is used as the basis of determining the *Maximum Applied Water Allowance*s.

"*Recycled water*" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and *water features*, and which is not intended for human consumption.

"*Rehabilitation project*" means a *landscape project* that results in the substantial removal and replacement of, and/or modifications to, existing landscaping and meets the requirements under Section 9.146.110.3(A)(3) and (5).

"*Runoff*" means water which is not absorbed by the soil or landscape to which it is applied and flows from the *landscaped area*. For example, *runoff* may result from water that is applied at too great a rate (application rate exceeds *infiltration rate*) or when there is a slope.

"*Smart automatic irrigation controller*" means an automatic timing device used to remotely control *valves* that operate an irrigation system and which schedules irrigation events using either evapotranspiration (weather-based) or soil moisture data.

"*Special landscaped area*" or "*SLA*" means an area of landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with *recycled water*, *water features* using *recycled water*, and areas dedicated to active play such as parks, sports fields, golf courses, and areas where *turf* provides a playing surface.

"*Sprinkler head*" means a device which delivers water through a nozzle.

"*Static water pressure*" means the pipeline or municipal water supply pressure when water is not flowing.

"*State*" means the State of California.

"*Station*" means an area served by one *valve* or by a set of *valves* that operate simultaneously.

"*Swing joint*" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

"*Turf*" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

"*Valve*" means a device used to control the flow of water in an irrigation system.

"*Water-conserving plant species*" means a plant species identified as having a low *plant factor*.

"*Water Efficient Landscape Regulations*" means those regulations established in Chapter 9.146, section 9.146.110 and following of the *Code*.

"*Water Efficient Landscape Worksheets*" means the worksheets required and selected to be completed by the *project applicant* pursuant to Section 2.2 of these *Guidelines* and which are included in **Appendix C** hereof.

"*Water feature*" means a design element where water is artificially supplied and where open water performs an aesthetic or recreational function. *Water features* include artificial ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools. The surface area of *water features* is included in the high water use *hydrozone* of the *landscaped area*. Constructed wetlands used for on-site wastewater treatment, habitat protection or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not *water features* and, therefore, are not subject to the water budget calculation.

"*Water Quality Code*" means Title 15, Chapter 15.14 of the *Code*.

"*Water Use Classification of Landscape Species*" or "*WUCOLS*" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000, appearing in "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California," and currently available at the California Department of Water Resources website: www.water.ca.gov .

"*Watering window*" means the time of day irrigation is allowed pursuant to any applicable *city*, regional, *State*, or *local water purveyor* water conservation or drought response laws, rules, policies, or regulations.

APPENDIX B - REFERENCE EVAPOTRANSPIRATION (ETO) TABLE

REFERENCE EVAPOTRANSPIRATION (ETO) TABLE

Appendix B - Reference Evapotranspiration (ETo) Table*													
City	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual ETo**
Irvine	2.2	2.5	3.7	4.7	5.2	5.9	6.3	6.2	4.6	3.7	2.6	2.3	49.6
* The values in this table were derived from: (1) California Irrigation Management Information System (CIMIS); (2) Reference EvapoTranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999; (3) Reference Evapotranspiration for California, University of California, Department of Agriculture and Natural Resources (1987) Bulletin 1922 4) Determining Daily Reference Evapotranspiration, Cooperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426													

APPENDIX C – WATER EFFICIENT LANDSCAPE WORKSHEET

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:

MAWA = *Maximum Applied Water Allowance* (gallons per year)
ETo = Reference Evapotranspiration **Appendix B** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor (ETAF)*
1.0 = *ETAF* for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = *Conversion Factor* (to gallons per square foot)
SLA = *Special Landscaped Area* (square feet)

Example Calculation: a hypothetical landscape project in Santa Ana, CA with an irrigated landscaped area of 40,000 square feet with 10,000 square feet of *Special Landscaped Area*. To calculate *MAWA*, the annual *reference evapotranspiration* value for Santa Ana is 48.2 inches as listed in the Reference Evapotranspiration (ETo) Table in **Appendix B**.

	ETo		*ETAF*		LA or *SLA* (ft^2)		Conversion		*MAWA* (Gallons Per Year)
MAWA for LA =	48.2	x	0.7	x	40,000	x	*0.62*	=	836,752
MAWA for *SLA* =	48.2	x	1.0	x	10,000	x	*0.62*	=	298,840
Total *MAWA* =					50,000				1,135,592 Gallons per year for LA+*SLA*

Estimated Applied Water Use

EAWU = *ETo* x K_L x LA x *0.62* ÷ *IE* = Gallons per year	

where:	K_L = K_s x K_d x K_{mc}
EAWU = Estimated Applied Water Use (gallons per year) *ETo = Reference Evapotranspiration* **Appendix B** (inches per year) K_L = *Landscape Coefficient* LA = *Landscaped Area* (square feet) *0.62 = Conversion factor* (to gallons per square foot) *IE = Irrigation Efficiency = IME x DU (See definitions of* ***Appendix A*** *for example IE percentages)* *IME = Irrigation Management Efficiency (90%)* *DU = Distribution Uniformity* of irrigation head	K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values) K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges) K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*) WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

Example Calculation:

	ETo		KL		LA		Conversion		*IE*		*EAWU (Gallons per year)*
Special Landscaped Area	48.2	x	1.00	x	10,000	x	*0.62*	÷	0.75	=	398,453
Cool Season Turf	48.2	x	1.00	x	0	x	*0.62*	÷	0.71	=	0
Warm Season Turf	48.2	x	0.65	x	0	x	*0.62*	÷	0.71	=	0
High Water Using Shrub	48.2	x	0.70	x	0	x	*0.62*	÷	0.71	=	0
Medium Water Using Shrub	48.2	x	0.50	x	15,000	x	*0.62*	÷	0.65	=	344,815
Low Water Using Shrub	48.2	x	0.30	x	25,000	x	*0.62*	÷	0.75	=	298,840
Very Low Water Using Shrub	48.2	x	0.20	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Total *EAWU* =					50,000						1,042,109 Gallons per year

Compare *EAWU* with *MAWA*.
The *EAWU* (1,042,109 gallons per year) is less than *MAWA* (1,135,592 gallons per year). For this example, the water budget complies with the *MAWA*.

List *sprinkler heads*, microspray and drip *emitters* here along with average *precipitation rate* and *distribution uniformity* of irrigation head.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity* of Irrigation Head**
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection #__

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (*ETo* x 0.7 x LA in Sq. Ft. x *0.62*) + (*ETo* x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:

MAWA = *Maximum Applied Water Allowance* (gallons per year)
ETo = *Reference Evapotranspiration* **Appendix B** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor* (ETAF)
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = *Conversion factor* (to gallons per square foot)
SLA = *Special Landscaped Area* (square feet)

MAWA Calculation:

	ETo		*ETAF*		LA or *SLA* (ft^2)		Conversion		*MAWA (*Gallons Per Year)
MAWA for LA =		x	0.7	x		x	*0.62*	=	
MAWA for *SLA* =		x	1.0	x		x	*0.62*	=	
Total *MAWA* =									

Estimated Applied Water Use

EAWU = ETo x K_L x LA x *0.62* ÷ *IE* = Gallons per year

where:

EAWU = Estimated Applied Water Use (gallons per year)
ETo = Reference Evapotranspiration **Appendix B** (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
IE = Irrigation Efficiency = IME x DU
IME = Irrigation Management Efficiency (90%)
DU = distribution uniformity of irrigation head

$K_L = K_s \times K_d \times K_{mc}$

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

EAWU Calculation:

	ETo		KL		LA		Conversion		*IE*		*EAWU (*Gallons Per Year)
Special Landscaped Area		x		x		x	*0.62*	÷		=	
Cool Season Turf		x		x		x	*0.62*	÷		=	
Warm Season Turf		x		x		x	*0.62*	÷		=	
High Water Using Shrub		x		x		x	*0.62*	÷		=	
Medium Water Using Shrub		x		x		x	*0.62*	÷		=	
Low Water Using Shrub		x		x		x	*0.62*	÷		=	
Very Low Water Using Shrubs		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
Other		x		x		x	*0.62*	÷		=	
Total *EAWU* =											

List *sprinkler heads*, microspray and drip *emitters* here along with average *precipitation rate* and *distribution uniformity* of irrigation head.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity* of Irrigation Head**
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

APPENDIX D – LANDSCAPE SUBMITTAL SHEET

LANDSCAPE SUBMITTAL SHEET

PROJECT NAME:_____ **PERMIT NO:**_____

TRACT/PARCEL/LOT:_____ **PROJECT ADDRESS:**_____

SUBMITTED BY:_____ **DATE RECEIVED:**_____

COMPANY:_____ **RECEIVED BY:**_____

TELEPHONE:_____ **CHECKED BY:**_____

CONTACT:_____ **DATE RETURNED:**_____

RETURNED TO:_____

THE FOLLOWING ITEMS ARE REQUIRED FOR COMPLETE SUBMITTAL:

FIRST CHECK

- ☐ **5** Sets of plans 24" x 36
- ☐ **1** Copy of Planning 'Conditions of Approval'
- ☐ **1** Copy of approval from other agencies (if applicable)
- ☐ Plan check fee of $. See fee schedule
- ☐ Other _____
- ☐ Other _____
- ☐ Other _____

DUE AT PERMIT ISSUANCE

- ☐ **1 set** of signed mylars (by landscape architect and city engineer)
- ☐ **1** set of full size plans
- ☐ **2** sets of half-size plans
- ☐ **I** Inspection Deposit $_____(see fee schedule)
- ☐ Surety (100% of estimate)
- ☐ CD of .Piffle (see attached specifications)
- ☐ Other_____

ALL PLAN REVISION SUBMITTALS

- ☐ **3 s**ets of revised blue lines
- ☐ Previous check print
- ☐ Additional plan check deposit (if required) $_____
- ☐ Other_____
- ☐ Other_____

DUE AT PROJECT CLOSE OUT

- ☐ Redline as-builts
- ☐ CD of signed redline as-builts
- ☐ Other_____

FINAL SUBMITTAL FOR CITY APPROVAL

- ☐ Original mylars (all sheets must be 24" x 36" maximum, stamped & signed by landscape architect)
- ☐ Previous Check Print

APPENDIX E – CERTIFICATION OF LANDSCAPE DESIGN

CERTIFICATION OF LANDSCAPE DESIGN

I hereby certify that:

(1) I am a professional appropriately licensed in the State of California to provide professional landscape design services.

(2) The landscape design and water use calculations for the landscape project located at _____ _____ _____ (provide street address or parcel, tract, or lot number(s)) were prepared by me or under my supervision. (Attach additional sheets as necessary.)

(3) The landscape design and water use calculations for the identified property comply with the requirements of the City of Lake Forest Water Efficient Landscape Regulations and the Guidelines for Implementation of the City of Lake Forest Water Efficient Landscape Regulations.

(4) The information I have provided in this Certification of Landscape Design is true and correct and is hereby submitted in compliance with the Guidelines for Implementation of the City of Lake Forest Water Efficient Landscape Regulations.

Print Name	Title	Date
Signature		License Number
Company		Address
Telephone	Fax	E-mail Address

For City Use only.

_____
Date received

_____
Name

_____
Signature

Landscape Design Professional's Stamp (if applicable)

APPENDIX F – CERTIFICATE OF COMPLETION

CERTIFICATE OF COMPLETION

I hereby certify that:

(1) I am a professional appropriately licensed in the State of California to provide professional landscape design services.

(2) The landscape project for the property located at _____

_____

(provide street address or parcel, tract, or lot number(s)) was installed by me or under my supervision. (Attached additional sheets as necessary.)

(3) The landscaping for the identified landscape project has been installed in substantial conformance with the approved Landscape Documentation Package, and complies with the requirements of the City of Lake Forest Water Efficient Landscape Regulations (Chapter 9, Sections 9.146.110 through 9.146.110.10 of the Lake Forest Municipal Code) and the Guidelines for Implementation of the City of Lake Forest Water Efficient Landscape Regulations for the efficient use of water in the landscape.

(4) The information I have provided in this Certificate of Completion is true and correct and is hereby submitted in compliance with the Guidelines for Implementation of the City of Lake Forest Water Efficient Landscape Regulations.

Print Name	Title	Date
Signature		License Number
Company		Address
Telephone	Fax	E-mail Address

For City use only.

☐ Project Approved
☐ Project Not Approved

_____
Name Title

_____
Signature Date

Reasons for denial included in attached sheet(s).

Landscape Design Professional's Stamp
(If Appropriate)

APPENDIX G – CHECKLIST OF LANDSCAPE DOCUMENTATION PACKAGE

CHECKLIST OF LANDSCAPE DOCUMENTATION PACKAGE

1. Project Information

Date	Project Name
Project Applicant	Title
Company	Telephone/Fax/E-mail
Company Street Address	City/State/Zip Code
Project Street Address	Project Parcel, Tract or Lot Number(s), if available.
Project Type	Total Landscaped Area (Square Feet)
Water Supply Type	Additional Project Information (may attach additional sheets)

2. Property Owner Information

Name(s)	Street Address
City/State/Zip code	Telephone/Fax/E-mail
Title (if applicable)	Company (if applicable)
Company Address (if applicable)	City/State/Zip

3. Elements of Landscape Documentation Package Submitted:

- ☐ Certification of Landscape Design
- ☐ Landscape Submittal Sheet
- ☐ Maximum Applied Water Allowance (MAWA) Calculation
- ☐ Estimated Applied Water Use (EAWU) Calculation
- ☐ Water Efficient Landscape Worksheet
- ☐ Hydrozone Information Table
- ☐ Water Budget Calculations
- ☐ Soil Management Report
- ☐ Landscape Design Plan
- ☐ Irrigation Design Plan
- ☐ Grading Design Plan (if applicable)
- ☐ Additional Landscape Project Information (see attached sheets)